Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (currently amended): A flow cell comprising:

a substrate having at least one sample channel ~~and~~ integral with at least one optical fiber channel holder;

wherein each sample channel has a curved portion to deliver fluid to an isolated sensing area;

wherein each optical fiber channel holder has ~~at least one~~ an optical fiber disposed ~~within each optical fiber channel holder~~ therein, wherein each optical fiber has at least one grating and wherein each optical fiber is precisely aligned and tensioned in a straight line within each optical fiber channel holder;

wherein the isolated sensing area is defined as an area where each optical fiber grating is ~~in contact with~~ proximate to the curved portion of each sample channel, ~~defining a sensing area~~; and

at least one sample port positioned in an operable relationship to at least one sample channel.

Claim 2 (canceled)

Claim 3 (original): A flow cell according to claim 1, wherein the substrate has a monolithic structure.

Claim 4 (original): A flow cell according to claim 3, wherein the monolithic structure is either a cylinder or a planar structure.

Claim 5 (original): A flow cell according to claim 1, wherein the substrate comprises at least two mating pieces.

Claim 6 (original): A flow cell according to claim 5, wherein a plurality of mating pieces form a kit having interchangeable parts whereby the configuration of the flow cell is modified.

Claim 7 (original): A flow cell according to claim 5, wherein the mating pieces form either a cylinder or a planar structure.

Claim 8 (original): A flow cell according to claim 1, further comprising at least one sample outlet positioned in an operable relationship to at least one sample channel.

Claim 9 (original): A flow cell according to claim 8, wherein the substrate has a monolithic structure.

Claim 10 (original): A flow cell according to claim 9, wherein the monolithic structure is either a cylinder or a planar structure.

Claim 11 (original): A flow cell according to claim 8, wherein the substrate comprises at least two mating pieces.

Claim 12 (original): A flow cell according to claim 11, wherein a plurality of mating pieces form a kit having interchangeable parts whereby the configuration of the flow cell is modified.

Claim 13 (original): A flow cell according to claim 11, wherein the mating pieces form either a cylinder or a planar structure.

Claim 14 (original): A flow cell according to claim 1, wherein the flow cell comprises one sample port and a plurality of sample channels.

Claim 15 (original): A flow cell according to claim 1, wherein the flow cell comprises a plurality of sample ports and one sample channel.

Claim 16 (original): A flow cell according to claim 8, wherein the flow cell comprises one sample port, a plurality of sample channels, and one sample outlet.

Claim 17 (original): A flow cell according to claim 8, wherein the flow cell comprises one sample port, a plurality of sample channels, and a plurality of sample outlets.

Claim 18 (original): A flow cell according to claim 8, wherein the flow cell comprises a plurality of sample ports, one sample channel, and one sample outlet.

Claim 19 (original): A flow cell according to claim 8, wherein the flow cell comprises a plurality of sample ports, one sample channel, and a plurality of sample outlets.

Claim 20 (original): A flow cell according to claim 8, wherein the flow cell has 2 sample channel ports.

Claim 21 (original): A flow cell according to claim 8, wherein the flow cell has 8 sample channel ports.

Claim 22 (original): A flow cell according to claim 8, wherein the flow cell has 96 sample channel ports.

Claim 23 (original): A flow cell according to claim 8, wherein the flow cell has 384 sample channel ports.

Claim 24 (original): A flow cell according to claim 8, wherein the flow cell has 1536 sample channel ports.

Claim 25 (original): A flow cell according to claim 8, wherein each sample channel is spaced apart a distance of less than or about 9mm.

Claim 26 (original): A flow cell according to claim 8, wherein the flow cell is microtiter plate compatible.

Claim 27 (original): A flow cell according to claim 1, wherein each sample port has a means to control delivery of the sample into each sample channel.

Claim 28 (original): A flow cell according to claim 27, wherein the means to control delivery of the sample into each sample channel is by aspiration.

Claim 29 (original): A flow cell according to claim 27, wherein the means to control delivery of the sample into each sample channel is by a continuous flow.

Claim 30 (original): A flow cell according to claim 27, wherein the means to control delivery of the sample into each sample channel is by a continuous flow with dwell time.

Claim 31 (original): A flow cell according to claim 8, wherein each sample port has a means to control delivery of the sample into each sample channel.

Claim 32 (original): A flow cell according to claim 31, wherein the means to control delivery of the sample into each sample channel is by aspiration.

Claim 33 (original): A flow cell according to claim 31, wherein the means to control delivery of the sample into each sample channel is by a continuous loop.

Claim 34 (original): A flow cell according to claim 31, wherein the means to control delivery of the sample into each sample channel is by a continuous flow.

Claim 35 (original): A flow cell according to claim 31, wherein the means to control delivery of the sample into each sample channel is by a continuous flow with dwell time.

Claim 36 (original): A flow cell according to claim 8, wherein the sample is selected from the group consisting of: a liquid sample; a gas sample; and a complex sample.

Claim 37 (original): A flow cell according to claim 1, wherein the grating is a long period grating.

Claim 38 (currently amended): A flow cell according to claim 37, wherein a ~~reacting~~ reactive coating is positioned in an operable relationship to the long period grating.

Claim 39(original): A flow cell according to claim 1, wherein the grating is a Bragg grating.

Claim 40 (original): A flow cell according to claim 8, wherein the grating is a long period grating.

Claim 41 (original): A flow cell according to claim 40, wherein a reactive coating is positioned in an operable relationship to the long period grating.

Claim 42 (original): A flow cell according to claim 8, wherein the grating is a Bragg grating.

Claims 43 – 50 (canceled)

Claim 51 (currently amended): A flow cell kit comprising an upper substrate having at least one curved sample channel for delivering a sample to an isolated sensing area and at least one sample port disposed therein; at least one optical fiber channel holder having ~~at least one~~ an optical fiber disposed therein wherein each optical fiber has ~~having~~ ~~a~~ at least one grating disposed therein wherein each optical fiber is precisely aligned and tensioned in a straight line within each optical fiber channel holder; wherein the optical fiber channel holder has a means to connect to the upper substrate to form a unit wherein the isolated sensing area is defined as an area where the grating is proximate to the curved portion of the sample channel; and a lower substrate having a means to connect to the optical fiber channel holder on a side opposite from the upper substrate.

Claim 52 (currently amended): A flow cell kit according to claim 51, wherein the upper and lower substrates each have a means to interconnect with each other to form an array.

Claim 53 (new): A flow cell according to claim 12, comprising an upper section having at least one sample channel and at least one sample port; a middle section comprising an optical fiber channel holder having an optical fiber disposed therein; a lower section serving as a support base; wherein the upper section and the lower section are counter-sunk to permit critical alignment of the optical fiber channel holder with each sample channel.